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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FAN, CHIEH M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 11/10/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/681,360

Applicant(s)

NGUYEN, QUANG

Examiner

Chieh M Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

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DETAILED ACTION

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claims c1-c10 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims c1-c10 of copending Application No. 09/681,359. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Objections

3. The numbering of claims is not in accordance with 37 CFR 1.75(f) which requires the claims to be numbered consecutively in Arabic numerals. The applicant needs to renumber the claims from c1 through c10 to 1 through 10.

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4. Claims c1-c10 are objected to because of the following informalities:

Regarding claim c1, "the multiple sub-channels" in line 6 should be changed to --- multiple sub-channels ---; "the received set (I,Q)" in line 11 should be changed to --- received set (I,Q) ---; "the input bit-stream" in lines 15-16 should be changed to ---an input bit-stream---; "the decoded data" in line 17 should be changed to --- decoded data ---; and "the output" in line 18 should be changed to --- an output ---.

Regarding claim c9, "imaginary par" in line 15 should be changed to --- imaginary part ---; "the guard interval" in line 19 should be changed to --- a guard interval ---; and "with and FIR filter" in line 20 should be changed to --- with an FIR filter ---.

Regarding claim c10, "the guard interval" in line 5 should be changed to --- a guard interval ---; and "M complex point (I,Q)" in line 10 should be changed to --- M complex points (I,Q) ---.

Appropriate correction is required.

5. Claim c3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In particular, the limitation of claim c3 has been recited in lines 12-13 of claim c1.

6. Claims c9 and c10 are method claims. The elements of a method claim are steps that should usually be verbal phrases introduced by a gerund or verbal noun (the "-ing"

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form of a verb). For example, on line 3 of claim 9, "sub-divide the high-speed R-Mbps input serial data" should be --- sub-dividing the high-speed R- Mbps input serial data ---.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims c1-c10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim c1, claim c1 recites the limitation "the I and Q component values" in line 11. There is insufficient antecedent basis for this limitation in the claim. Claim c1 recites the limitation "the I and Q sequences of samples" in line 22 There is insufficient antecedent basis for this limitation in the claim.

Regarding claim c5, claim c5 recites the limitation "the UMT broadband" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim c9, step (6) of claim c9 adds the guard interval to the I and Q sequences of N samples, which will result in I and Q sequence with more than N samples. It is not clear how the subsequent step (7) only modifies the I and Q sequences of N point samples. Further, the term "its" has been recited three times in

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lines 11 and 15 (twice). It is not clear what "its" is referred to. Moreover, are all three occurrences of "its" referred to the same "it"?

Regarding claim c10, claim c10 recites the limitation "the M bit-streams" in line 10. There is insufficient antecedent basis for this limitation in the claim. Further, step (2) of claim c10 removes the guard interval from the I and Q sequence of N samples, which will result in I and Q sequences with less than N samples. It is not clear how N-point FFT in the subsequent step (3) may be performed.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims c1-c10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al. (U.S. Patent No. 6,493,331, "Walton" hereinafter) in view of Pierzga et al. (US 2001/0055320, "Pierzga" hereinafter), Seki et al. (U.S. Patent No. 5,771,224, provided by the applicant in the IDS filed 11/28/02, "Seki" hereinafter), and Berens et al. (U.S. Patent No. 6,272,183, "Berens" hereinafter).

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Regarding claims c1-c3 and c8-c10, Walton teaches an OFDM communication system comprising:

- a transmitter (1416A-1416T in Fig. 15);

- a receiver (1422A-1422R in Fig. 14)

- an N-point IFFT processor (1520A-1520T in Fig. 15);

- a turbo codes baseband processor (1512A-1512K in Fig. 15, col. 52, lines 32-46) for encoding transmit data;

- an 8-PSK mapper (1532A-1532K, 1430 in Fig. 15; col. 53, lines 26-29; col. 54, lines 56-59; col. 46, line 46);

- a serial-to-parallel (S/P) converter (1510 in Fig. 15);

- a channel selector (1534 in Fig. 15; col. 54, lines 34-36) for assigning bit-streams into sub-channels;

- a guard interval adder (1522A-1522T in Fig. 15) to add cyclic prefix and generate an OFDM signal; and

- an up-converter to up-convert the frequency of the OFDM signal to radio frequency.

Note that it is well known that a receiver performs reverse procedures of a transmitter. Walton therefore implicitly teaches a FFT processor, a turbo codes baseband processor for decoding the received data; a 8-PSK de-mapper, a parallel-to-serial (P/S) converter, a channel-de-selector, a guard interval remover, and a down-converter.

Walton does not particularly teaches (a) the up-converter comprises a wave shaper, (b) the up-converter comprises an IQ modulator, (c) the down-converter comprises an IQ demodulator, (d) an AFC clock recovery circuitry, and (e) the turbo codes baseband processor uses a SISO MAP decoder to decode the received data.

With respect to item (a), Pierzga teaches a pulse shaping filter is used in an OFDM system such that more efficient use can be made of the available RF spectrum (see paragraph 0156). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate wave shaper into the up-converter of Walton, such that more efficient use can be made of the available RF spectrum.

With respect to item (b) and (c), it is well known an IQ modulator and IQ demodulator are explicitly required in a communication system that communicate data with I and Q components using radio frequency, because the data need to be converted to/from the radio frequency. Seki teaches an IQ modulator at an OFDM transmitter (16 in Fig. 3) and an IQ demodulator at an OFDM receiver (23 in Fig. 4). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that there must be an IQ modulator in the up-converter of Walton and an IQ demodulator in the down-converter of Walton because the IQ modulator and demodulator are explicitly required.

With respect to (d), Seki teaches an AFC circuitry (25 in Fig. 4) in an OFDM receiver. It is well known that, in order to successfully demodulate the received signal in a communication system, the receiver must be synchronized with the transmitter.

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Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an AFC circuitry in the receiving end of Walton, so as to successfully demodulate the received signal.

With respect to item (e), Berens teaches decoding the turbo codes based on the use of SISO MAP decoder (col. 1, lines 27-32). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a SISO MAP decoder in the turbo codes baseband processor of Walton to decode the received data, so as to obtain optimum results.

Regarding claim c4, the claimed limitation is inherent property for an OFDM system.

Regarding claims c5-c7, Walton teaches using a demultiplexer (1510 in Fig. 15, col. 52, lines 27-34) to divide high-speed bit-stream into multiple slow-speed sub bit-streams.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ling et al. (US 2003/0043928).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.



Chieh M Fan
Examiner
Art Unit 2634

cmf
November 1, 2003